= 0.67, $p < 0.01$). Specifically, less knee pain, stronger plantarflexors, quadriceps and hamstrings, greater knee flexion range of motion, and greater APA velocity were related to better scores on the CB&M.
Conclusions: Dynamic balance and mobility were related to a number of modifiable factors as eccentric plantarflexor, quadriceps, and hamstrings strength, knee joint range of motion and APA velocity. Given the considerable personal and economic burden of falls and the strong link to dynamic balance and mobility, interventions targeting such factors need to be developed.

Mean (95% CI) values for the CB&M scores and all factors included in the final model.

Factor	Mean (95% CI)
Community balance and mobility scale (/96)	75 (69.8 - 80.2)
Knee pain (0 - 10)	2 (1.1 - 2.9)
Eccentric plantarflexion strength at 90°/s (Nm/kg)	1.36 (1.20 - 1.52)
Eccentric quadriceps strength at 90°/s (Nm/kg)	1.70 (1.42 - 1.98)
Eccentric hamstrings strength at 90°/s (Nm/kg)	1.40 (1.23 - 1.57)
Knee flexion range of motion (°)	128.7 (125.2 - 132.2)
Average APA velocity (m/s)	0.10 (0.07 - 0.12)

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FALLS ASSOCIATED WITH KNEE INSTABILITY IN PEOPLE WITH KNEE OSTEOARTHRITIS: BIOMECHANICAL RISK FACTORS AND PAIN

M. van der Esch [†], A. de Zwart, Jr. [†], M. Pijnappels [‡], M. Hoozemans [‡], M. van der Leeden [†], L. Roorda [†], J. Dekker [§], W. Lems [‖], J. van Dieën [¶]. [†] *Amsterdam Rehabilitation Research Centre Reade, Amsterdam, Netherlands;* [‡] *MOVE Res. Inst. Amsterdam, Faculty of Human Movement Sci., VU Univ. Amsterdam, The Netherlands, Amsterdam, Netherlands;* [§] *Amsterdam Rehabilitation Research Centre Reade. VU Univ. Med. Ctr., Dept. of Rehabilitation Med., Amsterdam, the Netherlands. VU Univ. Med. Ctr., Dept. of Psychiatry, Amsterdam, the Netherlands, Amsterdam, NETHERLANDS;* [‖] *Amsterdam Rehabilitation Research Centre Reade. 6VU Univ. Med. Ctr., Dept. of Rheumatology, Amsterdam, the Netherlands, Amsterdam, Netherlands;* [¶] *MOVE Res. Inst. Amsterdam, Faculty of Human Movement Sci., VU Univ. Amsterdam, The Netherlands. 4King Abdulaziz Univ., Jeddah, Saudi Arabia., Amsterdam, NETHERLANDS*

Introduction: The purpose of the study was to establish the association between muscle strength, knee joint proprioception, varus-valgus knee joint laxity, knee pain and fall history within a group of diagnosed knee OA patients reporting knee instability.Subjects with knee osteoarthritis (OA) have an approximately 30% higher fall incidence than healthy older adults. Increased risk of falls might be associated with muscle weakness, impaired proprioception, high varus-valgus joint laxity and knee pain.
Methods: We analyzed the data of 301 subjects (203 females, 98 males, 35-82 year) with diagnosed knee OA and self-reported knee instability. The experience of at least one fall in the previous 3 months was assessed by questionnaire. Muscle strength, proprioception, and varus-valgus joint laxity were assessed using specifically designed measurement devices and a numeric rating scale (NRS) assessed pain. Differences in biomechanical factors between fallers and non-fallers were calculated. All factors were included in logistic regression analyses to assess the association between biomechanical factors and falls.<br Results. Over 10% (31 out of 301) of subjects reported a fall in the previous 3 months. Between fallers and non-fallers, significant differences were found for extension muscle strength (p = 0.017), flexion muscle strength ($p = 0.041$) and knee pain ($p < 0.001$). Extension muscle strength (OR 0.3, 95% CI 0.1-0.8, $p = 0.022$), flexion muscle strength (OR 0.2, 95% CI 0.0-1.0, $p = 0.048$) and knee pain (OR 1.4, 95% CI 1.2-1.6, $p < 0.001$) were associated with falls. No significant associations were found for proprioception and varus-valgus joint laxity. The association between muscle strength (extension and flexion) and falls was not affected by proprioception, varus- valgus joint laxity. Knee pain was independently associated with falls. By inclusion of knee pain in multivariate regression analyses both extension and flexion strength showed no association with falls.
Conclusion: Low knee extension and flexion muscle strength, and high knee pain are significantly associated with an increased risk of falls in patients with knee OA and self-reported knee instability.

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REMOTE ASSESSMENTS AND INSTRUCTIONS FOR HOME-REHABILITATION VIA CUSTOM-MADE WEBSITE IN PATIENTS WITH HIP AND KNEE OSTEOARTHRITIS, A PRELIMINARY REPORT

Y. Uesugi [†], C. Nishii [‡], C. Yamada [‡], S. Hayashi [§], R. Kuroda [§], S. Hashimoto [§], T. Matsumoto [§], T. Matsushita [§], T. Nishii [‖], T. Fujishiro [§]. [†] *Kobe Univ. Graduate Sch. of Hlth.Sci., Kobe, Japan;* [‡] *Faculty of Nursing, Kobe Univ. Sch. of Med., Kobe, Japan;* [§] *Dept. of Orthopaedic Surgery, Kobe Univ. Graduate Sch. of Med., Kobe, Japan;* [‖] *Dept. of Orthopaedic Med. Engineering, Osaka Univ. Graduate Sch. of Med., Osaka, Japan*

Purpose: It has been reported that for osteoarthritis (OA) patients, continuing the recommended exercise treatment in an efficient way at home is difficult. We therefore have developed a new rehabilitation exercise program on the web, using ICT (Information and Communication Technology) that is rapidly gaining popularity nowadays. The website is designed to help hip and knee OA patients to continue their rehabilitation while interacting with medical staff. However, we were skeptical whether the patients can use the system, for most OA patients are elderly. It was important to make sure that every patient can use this tool. In this study, we investigated the usefulness of rehabilitation exercise website.
Methods: We developed a rehabilitation website (online rehabilitation) expecting it to be a helpful ICT tool for patients to continue exercising. The website consists of:
1. A bulletin board that allows patients and medical staff to contact each other regularly.
2. An online exercise diary that lets patients record exercise counts which can be shared with medical staff.
3. Video uploading feature that lets medical staff check to see if the exercises are carried out properly.
We confirmed that the patients can use this system and asked them what they thought the problems of the system were. We also asked them for their opinion about it.
We prospectively recruited symptomatic hip or knee OA outpatients at the "A" University Hospital in Japan, from July to September in 2013, who were recommended treatment through exercise rehabilitation. All participants provided informed consent to the study, which had been approved by the Institutional Review Board.
The patients were introduced to the website and given individual ID numbers and passwords to access the site.
1. Nursing teacher and students (Nursing staff) and patients exchanged comments on the online bulletin board. As for the comments submitted by the nursing staff, anything that involved medical contents had to be confirmed by outpatient doctors. Aside from that, they mainly wrote comments of encouragement and acknowledgment of the patients' efforts to continue exercising.
2. Exercise counts were derived from summing up the counts patients have recorded.
3. Only the patients who said they can upload videos by themselves were asked to do it.
Results: Subject of the study were 10 patients (4 males, 6 females, 39-69 years old) with hip OA (9 patients) and knee OA (1 patient).
1. As for the interactions on the bulletin board, patients often left comments about the content of their exercise and what they thought about it, and even praised themselves for their efforts. How a patient was taking a temporary break from the exercise due to pain was also mentioned. This was followed-up with comments by the nursing staff that exercise should be suspended when it causes pain, and it should be done in their own pace. Patients who were exercising well got encouraging replies and were praised for their efforts. One patient wrote how he sweated a lot while exercising, and since it was summer he was advised to take plenty of fluid to avoid dehydration.
2. As for exercise counts, patients with high motivation recorded exercises daily. Some have registered but did nothing. Patient who exercised the most recorded 97 counts in three months, while the runner-up recorded 88 during 3 month. 3. Six out of ten patients thought they were capable of uploading their exercise videos on the website. In reality, however, only three were able to do so. Patients who failed to do so thought it was difficult to manipulate. There was an instance while watching an uploaded video where we caught a patient exercising on a hard floor. We then advised the patient to use a mat.
4. Opinions we received from the post-study patients include: "It is very inconvenient to be able to do rehabilitation exercise at home,"

"Encouragement from the co-medical staff via the website helped me continue," etc.
Conclusion: It has become apparent that the website we have developed played a role in triggering patients' motivation to continue their rehabilitation exercise. Enhancement of self-efficacy is said to be essential in continuing exercise routines. In this case, the patients' self-efficacy was enhanced due to the supporting and encouraging words. Meanwhile, modification of the uploading feature is thought to be necessary. The feature was added so that the medical staff can check if patients are exercising in a correct manner, but some patients found it difficult to manipulate it. The system is still facing the challenge of making the feature's usage more satisfactory through simplification of its manipulation.

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EFFECTIVENESS AND COST-EFFECTIVENESS OF A GROUP-BASED OUTPATIENT PHYSIOTHERAPY INTERVENTION FOLLOWING KNEE REPLACEMENT FOR OSTEOARTHRITIS: FEASIBILITY STUDY FOR A RANDOMISED CONTROLLED TRIAL

V. Wylde, N. Artz, S. Dixon, E. Marques, E. Lenguerrand, A. Blom, R. Gooberman-Hill. *Univ. of Bristol, Bristol, United Kingdom*

Purpose: Total knee replacement (TKR) is a common operation performed to provide pain relief and restore function. In 2012, 76,051 primary TKRs were performed in the UK National Health Service, with osteoarthritis (OA) as the primary indication for surgery in 97% of cases. Inpatient physiotherapy is routinely provided after TKR to enhance recovery prior to discharge. However, there is variation in the provision of outpatient physiotherapy across the UK. While research suggests that outpatient physiotherapy provides short-term benefit up to 3-months post-operative, the longer-term benefits are uncertain.
This study aimed to evaluate the feasibility of conducting a randomised controlled trial (RCT) to assess the longer-term effectiveness and cost-effectiveness of group-based outpatient physiotherapy following TKR for OA. Specific objectives were to assess trial design, ascertain recruitment and retention rates, identify barriers to participation, refine data collection methods, and evaluate uptake and patient satisfaction with the intervention.
Methods: Patients listed for primary TKR because of OA at a UK orthopaedic centre were approached about the study at their pre-operative assessment appointment. Patients who decided not to take part were asked about their reasons for non-participation. Patients were randomised to attend a newly developed post-operative physiotherapy class plus standard care or standard care only using a computer-generated randomisation system (Minim).
Patients allocated to the intervention group were invited to attend a weekly one-hour physiotherapy class, starting at 6 weeks after surgery and running over 6 consecutive weeks. The group classes were run by two physiotherapists within an outpatient gymnasium, and involved task-orientated and individualised exercises. Classes were held at a fixed time each week and ran on a rolling system, allowing new patients to join each week. Participants completed an evaluation questionnaire after the final class.
Outcomes assessment was by postal questionnaire prior to surgery and 2-weeks, 3-months and 6-months after surgery. Outcomes related to function, pain, balance, self-efficacy, participation and quality of life. Self-report resource use data were collected in the 3-month and 6-month post-operative questionnaires.
Results: 124 patients were approached about the study and 46 consented to participate (37% recruitment rate). Frequent reasons for non-participation were related to travelling distance, transportation, and time commitments.
23 patients were randomised to the intervention group. Of these patients, 6 patients did not attend any classes (3 had medical complications, 2 withdrew, 1 was on vacation). 17 patients attended the exercise class; 13 attended all 6 classes and 4 attended 5 classes. All attendees provided feedback about the class. All felt that one hour was the right amount of time. Most (15) patients were very satisfied with the range of exercises on offer. The task-orientated and individual exercises were given average usefulness ratings of 9.6/10 and 9.5/10, respectively. The rolling system of classes was acceptable to the physiotherapists as it allowed them to provide individualised advice to new patients while monitoring the progress of patients further on through the classes.
Retention of participants was acceptable; 2 patients were withdrawn from the intervention group (self-withdrawal) and 2 patients were withdrawn from the usual care group (post-operative knee amputation and surgery elsewhere). Questionnaire return rates were high in the intervention group (91% at 6-months post-operative) but lower in the usual care group (65% at 6-months post-operative).
Conclusion: Undertaking feasibility work for a RCT is labour-intensive; however this study highlights the importance of conducting such work. Collecting data on reasons for non-participation provided valuable information on barriers to participation in a trial with this population. The intervention was well attended, and feedback was positive. Delivering the intervention on a rolling basis was acceptable for staff, and potentially attractive from a hospital management viewpoint due to minimal administrative burden in offering weekly classes on set dates. Questionnaire completion was lower in the usual care group, highlighting the need for additional strategies to improve data collection e.g. telephone calls. Findings from this feasibility study will inform the design of the definitive trial to determine the effectiveness and cost-effectiveness of a group-based outpatient physiotherapy intervention following TKR for OA.

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EFFECTS OF KNEE JOINT ASPIRATION AND CORTICOSTEROID INJECTION ON FLEXION REFLEX EXCITABILITY, PAIN AND PEAK MUSCLE TORQUE IN INDIVIDUALS WITH CHRONIC ARTHRITIS

P.J. McNair[†], D. Rice[†], G. Lewis[†], N. Dalbeth[‡]. [†]*Auckland Univ. of Technology, Auckland, New Zealand;* [‡]*Univ. of Auckland, Auckland, New Zealand*

Aim: Marked weakness of the quadriceps muscles is typically observed in patients with arthritic joint disease. This is partly due to muscle atrophy and partly due to ongoing neural inhibition that prevents the quadriceps from being fully activated, a process known as arthrogenic muscle inhibition (AMI). The underlying neurophysiological mechanisms by which abnormal joint afferent output leads to AMI are only partially understood. One of the spinal reflex pathways thought to be involved is the Flexion Reflex. The Flexion Reflex is a polysynaptic pathway that typically produces a pattern of flexor facilitation and extensor inhibition. As such, it has been suggested that enhanced Flexion Reflex excitability may be partially responsible for quadriceps AMI. There is evidence from animal studies that experimental arthritis strongly increases flexion reflex excitability. However, it is unclear whether knee joint inflammation similarly affects flexion reflex excitability in humans. Thus the primary aim of this study was to examine the effects of knee joint aspiration and intraarticular corticosteroid injection on flexion reflex excitability, knee pain and knee extensor peak torque in individuals with chronic arthritis.
Methods: Sixteen patients with chronic arthritis (10 rheumatoid arthritis, 5 osteoarthritis, 1 psoriatic arthritis) and signs and symptoms of knee joint synovitis participated in this study. Flexion reflex threshold, knee pain and knee extensor peak torque were measured at baseline on two occasions, then immediately after knee joint aspiration alone, and 5 and 15 days after knee joint aspiration and the injection of 40 mg of methylprednisolone acetate. Statistical analysis involved repeated measures ANOVA.
Results: There were no changes in the dependant variables across the two baseline measurement points. Thereafter, the Flexion Reflex threshold increased by 20% after aspiration ($p < 0.05$) and by 39% ($p < 0.05$) and 50% ($p < 0.05$) at day 5 and 15 respectively following the combination of aspiration and corticosteroid injection. Knee extensor peak torque increased by 8% ($p < 0.05$) after aspiration and 15% ($p < 0.05$) and 23% ($p < 0.05$) at day 5 and 15 respectively. Knee pain was reduced by 60% ($p < 0.05$) at day 5 and 34% ($p < 0.05$) at day 15.
Conclusions: The change in flexion reflex excitability following aspiration alone is a novel finding, suggesting that intraarticular swelling may enhance flexion reflex excitability as well as increasing the excitability of other spinal reflex pathways such as group I non-reciprocal (Ib) inhibition. Changes in the threshold after aspiration and corticosteroid injection were indicative of their positive treatment effect in reducing inflammatory sources of joint afferent stimulation. Accompanying positive effects were observed in knee extensor torque and knee pain.